

553,590

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
4 November 2004 (04.11.2004)

PCT

(10) International Publication Number
WO 2004/094877 A2

- (51) International Patent Classification⁷: **F16J**
- (21) International Application Number:
PCT/US2004/011987
- (22) International Filing Date: 16 April 2004 (16.04.2004)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
60/463,293 16 April 2003 (16.04.2003) US
- (71) Applicant (for all designated States except US):
**FREUDENBERG-NOK GENERAL PARTNER-
SHIP** [US/US]; 47690 East Anchor Court, Plymouth,
Michigan 48170-2455 (US).
- (72) Inventor; and
- (75) Inventor/Applicant (for US only): **CLARK, Keith**
[US/US]; 1888 Buffalo Road, Rumney, New Hampshire
03266 (US).
- (74) Agent: **WANGEROW, Ronald**; Freudenberg-NOK Gen-
eral Partnership, Intellectual Property Department, 47690
East Anchor Court, Plymouth, Michigan 48170-2455 (US).
- (81) Designated States (unless otherwise indicated, for every
kind of national protection available): AE, AG, AL, AM,
AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN,
CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,
GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE,
KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD,
MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG,
PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM,
TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM,
ZW.
- (84) Designated States (unless otherwise indicated, for every
kind of regional protection available): ARIPO (BW, GH,
GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW),
Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), Euro-
pean (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR,
GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK,
TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW,
ML, MR, NE, SN, TD, TG).
- Published:
— without international search report and to be republished
upon receipt of that report
- For two-letter codes and other abbreviations, refer to the "Guid-
ance Notes on Codes and Abbreviations" appearing at the begin-
ning of each regular issue of the PCT Gazette.

(54) Title: UNITIZED PINION SEAL FOR AN AXLE

(57) Abstract: A unitized pinion seal assembly has a seal portion and a sleeve portion that are assembled in an interference fit relationship. The unitized pinion seal assembly is assembled to a carrier/bearing cage and an axle companion flange with proper spacing between non-sealing components, and without a spacer mounted between the two portions.

WO 2004/094877 A2